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Baba Educational Society Institute of Paramedical College of Nursing

Evaluation Criteria for Assignment

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Subject: Adult Health Nursing - I

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Name of Evaluator: Ms. Manisha Chaubey

SL.NO.	CRITERIA	ALLOTED MARKS	OBTAINED MARKD
1	Introduction	1	1
2	Content	2	1
3	Summary, conclusion & bibliography	1	1
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	TOTAL	05	4

Remarks:

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TOPIC- ELECTROCARDIOGRAM (ECG)

SUBJECT- ADULT HEALTH NURSING - I

Submitted To

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Electrocardiogram (ECG)

Introduction -

- The electrocardiogram provide a graphic depiction of the electrical forces generated by the heart.
- The ECG graph appear as a series of deflections or waves associated with each cardiac cycle.
- The ECG represents the temporal and spatical summation of the action potential of myocardial fibers typically measured with body-surface electrodes.
- ECGs are used to diagnose arrhythmias, abnormal electrolyte (potassium) level, and conduction abnormalities.
- They also used for screening and therapy guidance for heart disease as well as cardiac gating for imaging.

History -

The invention of the electrocardiogram by dutch physiologist Willem Einthoven in 1902 gave physicians a powerful tool to help them diagnose various forms of heart disease especially arrhythmias and acute myocardial infraction.

Definition - Electrocardiography

- "It is the record of electrical activity of heart recorded by the electrodes from the body surface. It is recorded with the help of an ECG machine and leads."
- ECG is define as "recording of electrical activity of heart on a graph paper".
- "Electrocardiogram (ECG) is a graphic recording of the electrical changes that occur within the heart during the cardiac cycle."

Purpose -

- Electrocardiogram is the most important signal tool for the diagnosis of arrhythmias.
- It is helpful to study the cardiac functions - rate, rhythm and axis.
- It helps to diagnose cardiac disease condition - myocardial infarction, injury, ischemia and hypertrophy.
- It helps to detect electrolytes imbalance hyperkalemia.
- To give valuable diagnostic information about cardiac function.
- To confirm the coronary heart disease in most cases.
- To demonstrate cardiac arrhythmias such as ventricular tachycardia and heart block.

Components -

- Electrocardiography consists of waves, complexes and intervals Waves or complex - It is deflection that can be positive or negative wave - atrial depolarization QRS complex - ventricular depolarization. T wave - ventricular repolarization.
- Segment - A is the period of time between a wave or complex, e.g. ST - segment.
- Interval - An interval is the time between two points on the ECG. e.g. PR - interval.
- Time duration (normal) for the P-wave - 0.08 seconds PR - interval less than 0.20 seconds (average 0.16 seconds). QRS complex 0.08 seconds. ST - segment - 0.12 seconds & T - wave - 0.16 seconds.

Types of ECG -

There are three major types of ECG are -

1- Resting ECG - You lie down for this type of ECG. No movement is allowed during the test, as electrical impulses from other muscles can interfere with the test. This type of ECG usually takes fives to 10 minutes.

2- Ambulatory ECG - For an ambulatory ECG you wear a portable recording device for at least 24 hours. You are free to move around normally while the device is attached. This type of monitoring may also be called Ambulatory EKG, Holter monitoring, 24-hour EKG or cardiac event monitoring.

3- Exercise stress test / Stress Test - This type of ECG helps your doctor see how well your heart is working during physical activity. It involves having an ECG while you ride a stationary exercise bike or walk on a treadmill. This type of ECG takes about 15 to 30 min to complete.

Leads used in ECG -

- 3 standard bipolar leads (I, II, III)
- 3 unipolar limb leads (aVR, aVR, aVF)
- 6 unipolar chest leads (V_1 to V_6)

Lead I - It measures electric potential difference between left arm & right arm.

Lead II - It measures electric potential difference between leg and right arm.

Lead III - It measures electric potential difference between left leg and left arm.

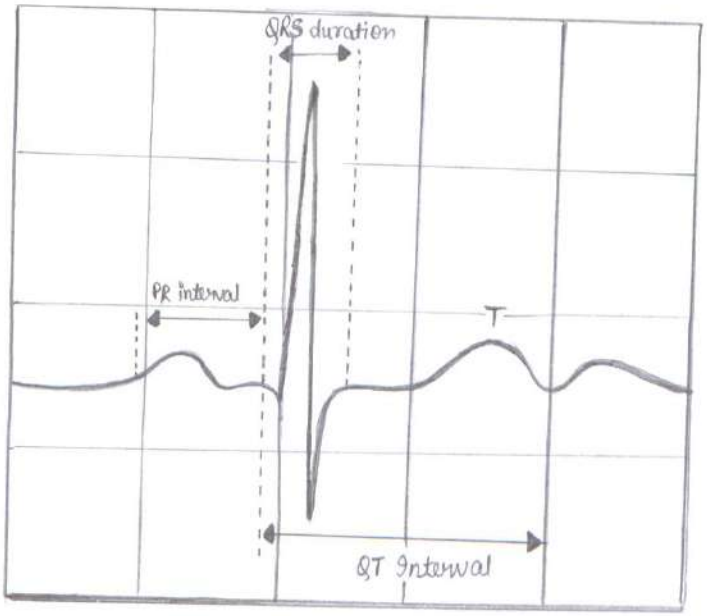
aVR (Augmented Voltage Right) - It measures electric potential difference b/w right limb & central point.

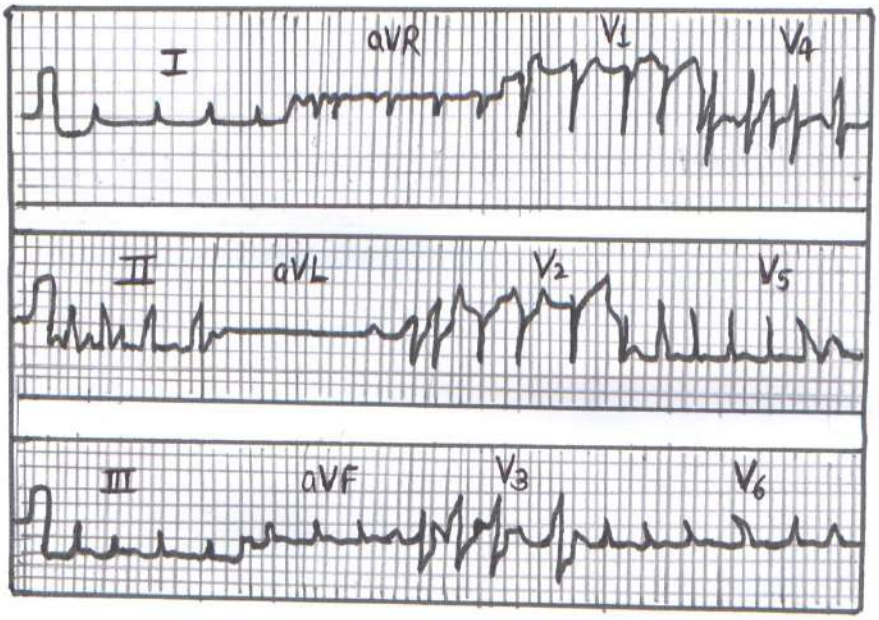
aVL (Augmented Voltage Left) - It measures electric potential difference b/w left arm and central point.

aVF (Augmented Voltage Foot) - It measures electric potential difference b/w left limb & central point.

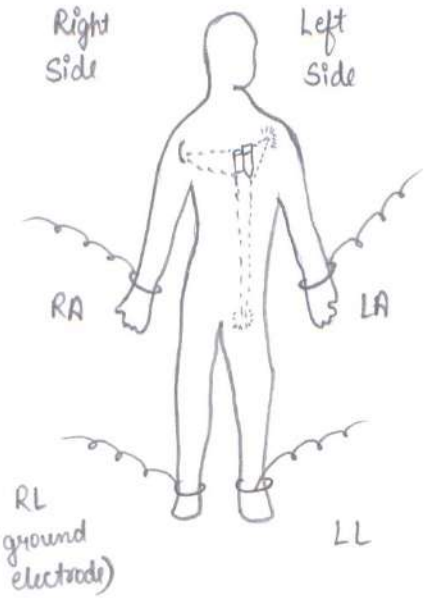
The electrode placed at the right leg serves as the ground electrode.

The Normal ECG Measurements

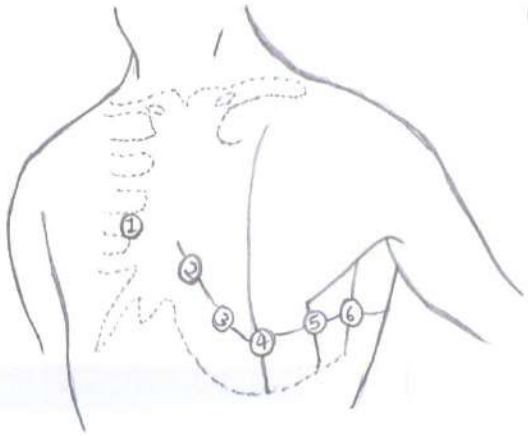




The conventional 12-lead electrocardiogram



A. Limb Leads



B. Chest Leads

Placement of the V Leads (Chest Leads) -

They measure the electric potential difference between the center of the heart and the following site.

- V_1 - Fourth Intercostal space to the right of the sternum.
- V_2 - Fourth Intercostal space to the left of the sternum.
- V_3 - Between V_2 and V_4.
- V_4 - Fifth intercostal space in the midclavicular line.
- V_5 - Fifth intercostal space in the anterior axillary line.
- V_6 - Fifth intercostal space in the midaxillary line.

ECG Interpretation -

Components	Characteristics
Rate	The bpm is commonly the ventricular rate. If atrial & ventricular rates differ, as in a 3rd degree block, measure both rates. Normal - 60 - 100 bpm slow (bradycardia): 60 bpm. Fast (tachycardia): 100 bpm.
Regularity	Measure R-R intervals and P-P intervals. Regular - Intervals consistent. Regularly irregular - Repeating pattern. Irregular - No pattern.
P Waves	If present - Same in size, shape, position? Does each QRS have a P wave? Normal - Upright (positive) & uniform Inverted - Negative Notched - P. None - Rhythm is junctional or ventricular.

PR Interval	Constant - Intervals are the same. Variable - Intervals differs. Normal - 0.12 - 0.20 sec and constant.
QRS Interval	Normal - 0.06 - 0.10 sec Wide - 0.10 sec None - Absent
QT Interval	Beginning of R wave to end to T wave Varies with HR. Normal - Less than half the R-R Interval.
Dropped beats	Occur in AV blocks. Occur in Sinus arrest.
Pause	Compensatory - Complete pause following a premature atrial contraction (PAC), premature junctional contraction (PJC), or premature ventricular contraction (PVC) Noncompensatory - Incomplete pause following a PAC, PJC, or PVC.
QRS Complex grouping	Bigeminy - Repeating pattern of normal complex followed by a premature complex. Trigeminy - Repeating pattern of 2 normal complexes followed by a premature complex. Quadrigeminy - Repeating pattern of 3 normal complexes followed by a premature complex. Couplets - 2 consecutive premature complexes. Triplets - 3 consecutive premature complexes.

Articles -

- ECG machine with 12 leads electrodes.
- Electrodes for 12 lead ECG
- Electro conductive gel.
- Top sheet
- Tissue paper.

Preparation of the Patients -

- Explain the procedure to the the patient.
- Reassure the client that the procedure is painless & safe.
- Ask the female client to remove all tight fitting clothing around the chest.
- Provide hospital gown or front open base shirt.
- Inform the client to lay supine position and be as relaxed as possible.
- Ensure that the ECG machine is in functioning condition.
- Inform the client not to move during the procedure.

Procedure -

- Preparation of the skin - The area of electrodes placement is cleansed with alcohol, excessive hair may be shaved or clipped from the site if appropriate.
- Attachment of the electrodes - Electrodes are applied to the chest wall securely attached to the lead wires and monitor. The monitor box may be worn around the waist or over the shoulder.
- Checking the equipment - The monitor box is checked for paper supply and whether it has fully charged battery or not.
- Activating the device - A tape is inserted, and the box is activated. It helps in recording & storing of continuous cardiac rhythm data transmitted by the electrodes.
- Keeping a record of events in a diary - The patient is instructed to keep a diary of activities and of any cardiac syncope, dyspnea, etc., that can occur while wearing the monitor for 24-72 hours.
- Removal of the monitor from the body - When the data measurement period is finished, the pads are removed and the monitor device is returned to its box.
- Returning the device - The monitor is then returned to the technician where the tape is interpreted by the computer and the report is generated.

After Care -

- The chest electrodes should be removed. After the patient has worn the monitor, gently remove the tape and the other equipment securing the electrodes.
- The ECG recording will be interpreted by a computer and a copy of a report is printed.
- The patient needs to take an appointment for discussion of the results of the same.
- Record and report in the nurse's sheet.

Indications -

- Dysrhythmia
- Chest pain
- Myocardial infraction.
- Heart rate determination.
- Hypertrophy or chamber dilatation.
- Pre-operative assessment.
- Pericarditis.
- Effects of systemic disease on heart.
- Effects of electrolyte disturbances.

Contraindications -

There are no absolute contraindications for an electrocardiogram. The relative contraindications to its use include :

- Patient refusal
- Allergy to the adhesive used to affix the leads.

Significance of ECG -

- ECG gives information about rate and rhythm of the heart.
- The physical orientation of the heart i.e - axis.
- It's a diagnostic tool for various heart conditions like hypertrophics, ischemia, infarction, arrhythmias.
- Conduction problems and space maker activity.
- ECG does not provide information about mechanical activity.

Complications -

1. Arrhythmias - It is irregularity of rate and rhythm of heart rate of pulse rate. Present in 80% of the patient caused by ischemia, electrolyte imbalance and sympathetic nervous system stimulation.

2. Congestive Heart failure - Pumping power of the heart fails or dimished with signs of slight dyspnea, restlessness, agitation or slight tachycardia, S_3 or S_4 heart sound Indicate heart failure.

3. Cardiogenic shock - Occurs when inadequate O_2 and nutrient are supplied to the tissue because of severe left ventricular failure.

4. Papilary Muscle Disfunction - This occur if the infarcted area include papilary muscles that attaches to mitral valve causing regurgitation which increase volume of blood in the left atrium.

5. Pericarditis - Acute Pericarditis and inflammation of the visceral or papietal pericardium may occur 2-3 days after an acute.

Nursing Responsibility -

- Nurses working in coronary care unit and intensive care unit should know to operate the ECG machine.
- Nurses should able to interpret and identify the dysrthythmia.
- Nurses should understand about the dysfunctions and loose connections.
- Nurses working in coronary care unit are responsible in ECG interpretation and treating with appropriate life - saving method as per institutional protocol.

Summary

An Electrocardiogram (ECG or EKG) records the electrical signal from the heart to check for different heart conditions.

Electrodes are placed on the chest to record the heart's electrical signals, which cause the heart beat.

The 12 lead surface ECG can indicate pathological changes even before structural changes in the heart can be diagnosed by other methods.

Therefore, recording of a ECG was of great value for several past generations of cardiologist and continues to provide vital informations.

Conclusion

Electrocardiography is basic method and it still remains the of detection and evaluation heart rhythm disorders in children age and follow up and results of treatment of rhythm disorders control of therapy for heart rhythm disorders, and in diagnostics of congenital heart diseases as well.

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